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No. 10

MARINE MOLLUSCA FROM ACAPULCO, MEXICO WITH NOTES ON OTHER SPECIES

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The following pages contain a list of the marine mollusca dredged in Acapulco Bay, Mexico, by the Templeton Crocker Expedition of the California Academy of Sciences in 1932.[1] Several species of special interest secured by the Expedition at other places are included. A report upon the collection as a whole will require a considerable amount of additional time for completion because of the very large number of species and specimens obtained.

This fine collection of shells, together with that made by the Hancock Expedition to the Galapagos Islands and the various expeditions of the Academy to west Mexican waters forms an

[1] For a general account of the Expedition see: Grunsky, C. E. The Templeton Crocker Expedition of the California Academy of Sciences, 1932. Foreword. Proc. Calif. Acad. Sci. ser. 4, vol. 21, no. 1, March 14, 1933, pp. 1-2. Introductory statement by Templeton Crocker, pp. 3-9, pl. 1.

excellent series for a study of the tropical American marine fauna. Many species secured by Mr. Crocker are new or little known to conchologists. The rare *Xenophora robusta* Verrill has heretofore been known only from the two original specimens and is one example of the nature of the collection as a whole.

Much time is required for the research necessary to prepare a comprehensive report on all of the tropical American mollusca now available because of the lack of illustrations, poor descriptions and the many scattered references in the literature.

List of Species from Acapulco, Mexico, Loc. 27,527 (C. A. S.)

Arca cf. aviculoides Reeve
Arca labiosa Sowerby
Arca nux Sowerby
Arca, (2 additional species)
Callocardia citharia Dall
Chione compta Broderip
Chione kellettii Hinds
Corbula ovulata Sowerby
Cyclinella subquadrata Hanley
Cardium (Laevicardium) cumingii Sowerby
Cardium (Fragum) graniferum Broderip & Sowerby
Cardium (Fragum) obovale Broderip
Crassatellites gibbosus Sowerby
Glycymeris tessellata Sowerby
Macoma panamensis Dall
Macrocallista squalida Sowerby
Mactra goniocyma Pilsbry & Lowe
Modiolus pallidus Dall
Nuculana acapulcensis Pilsbry & Lowe
Nuculana costellata Sowerby
Nuculana gibbosa Sowerby
Nuculana (Adrana) sowerbyana d'Orbigny
Nuculana sp.
Ostrea conchaphila Carpenter
Pecten circularis Sowerby
Pecten sericeus Hinds
Pecten tumbezensis d'Orbigny
Pitar callicomata Dall
Pitar lenis Pilsbry & Lowe
Semele incongrua Carpenter
Tagelus violescens Carpenter
Tellina (Eurytellina) panamaensis Li[2]
Tellina pristiphora Dall
Tellina rubescens Hanley
Dentalium oerstedii Mörch
Architectonica granulata Lamarck
Bursa albifasciata Sowerby
Calliostoma bonita Strong, Hanna & Hertlein, new species
Calliostoma leanus C. B. Adams
Calliostoma rema Strong, Hanna & Hertlein, new species
Cancellaria bullata Sowerby
Cancellaria indentata Sowerby
Cancellaria ventricosa Hinds
Cantharus pallidus Broderip & Sowerby
Cantharus vibex Broderip
Cerithium stercus-muscarum Valenciennes
Clathrodrilla nautica Pilsbry & Lowe
Clathurella adria Dall
Clava gemmata Hinds
Clavatula (Knefastia) tuberculifera Broderip & Sowerby
Clavus (Clathrodrillia) alcestis Dall
Clavus (Clathrodrillia) alcestis Dall var.
Clavus (Clathrodrillia) callianira Dall
Clavus (Clathrodrillia) heliplexa Dall
Clavus (Cymatosyrinx) ianthe Dall
Clavus (Brachytoma) nigerrimus Sowerby
Clavus (Cymatosyrinx) pallida Sowerby
Clavus (Cymatosyrinx) pudica Hinds
Clavus (Cymatosyrinx) rosea Sowerby
Clavus (Cymatosyrinx) rugifera Sowerby
Crepidula nummaria Gould
Crepidula cf. onyx Sowerby
Conus archon Broderip
Conus comptus Gould
Conus emarginatus Reeve

[2] *Tellina panamaensis* Li, Bull. Geol. Soc. China, vol. 9, no. 3, 1930, p. 262, pl. 5, fig. 32. "Gatun formation." Miocene. [Recent, according to Pilsbry, 1931.]
Tellina (Eurytellina) panamaensis Li, Pilsbry, Proc. Acad. Nat. Sci. vol. 83, 1931, p. 436, pl. 41, figs. 4, 5, 6. "Panama Bay, about 1 mile from mainland, off mouth of the Rio Grande, 10-40 ft." Also from Quarantine Island, Panama.

Conus ximines Gray
Conus sp.
Coralliophila hindsii Carpenter
Cosmioconcha palmeri Dall
Crassispira erebus Pilsbry & Lowe
Crucibulum imbricatum Sowerby
Crucibulum spinosum Sowerby
Distortio decussata Valenciennes
Enaeta barnesii Gray
Eupleura muriciformis Broderip
Fusinus dupetit-thouarsii Kiener
Harpa crenata Swainson
Latirus sp.
Hindsia acapulcana Pilsbry & Lowe
Lioglyphostoma acapulcanum Pilsbry & Lowe
Malea ringens Swainson
Metula amosi Vanatta
Mitra attenuata Reeve
Mitra zaca Strong, Hanna & Hertlein, n. sp.
Mitra sp.
Murex rectirostris Sowerby
Nassarius gemmulosus C. B. Adams
Nassarius miser Dall
Nassarius pagodus Reeve
Nassarius versicolor C. B. Adams
Natica broderipiana Recluz
Oliva spicata Balten
Phyllonotus bicolor Valenciennes
Polinices uber Valenciennes
Phos gaudens Hinds
Phos veraguensis Hinds
Recluzia insignis Pilsbry & Lowe
Strombina edentula Dall
Strombina dorsata Sowerby
Strombina gibberula Sowerby
Strombina recurva Sowerby
Terebra armillata Hinds
Terebra aspera Hinds
Terebra ligyrus Pilsbry & Lowe
Terebra lingualis Hinds
Terebra panamensis Dall
Terebra paphia Bartsch
Terebra varicosa Hinds
Terebra sp.
Turricula maura Sowerby
Turricula (Pleurofusia) militaris Hinds
Turricula sowerbyi Reeve
Turris oxytropis Sowerby
Turris picta Reeve
Turris sp.
Turritella mariana Dall
Turritella nodulosa King

Cancellaria bullata Sowerby

Plate 5, figure 7

Cancellaria bullata Sowerby, Proc. Zool. Soc. London, 1832, p. 51. "*Hab.* ad littora Americae Meridionalis et Centralis. (Payta and Gulf of Nocoiya.)" —Sowerby, Conch. Illustr. *Cancellaria*, Dec. 7, 1832, p. 6, pl. 12, fig. 35. "Dredged in mud at a depth of twelve fathoms, at Payta, and in the Gulf of Nocoiyo. Mr. Cuming." — Reeve, Conch. Icon. vol. 10, 1856, *Cancellaria*, sp. 5, pl. 2, figs. 5a, 5b. Earlier record from Gulf of Nicoya cited. — Sowerby, Thes. Conch. vol. 2, 1855, p. 457, pl. 94, fig. 56. "Found in the Gulf of Nocoya." — Tryon, Manual Conch. vol. 7, 1885, p. 78, pl. 5, fig. 78.

This species was dredged off Acapulco, Mexico. Tryon[3] united it with *Cancellaria tuberculosa* Sowerby[4] but Reeve's[5] figure of that species shows a heavier, lighter colored shell with stronger sculpture. Both species are characterized by the very wide, open umbilicus.

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[3] Manual Conch. vol. 7, 1885, p. 78, pl. 5, figs. 76, 77 (*C. tuberculosa*), fig. 78 (*C. bullata*). "*Iquiqui, Peru*, 7 fms. (Cuming); *Gulf of Nicoya, Central America*, 12 fms. (Cuming)."

[4] *Cancellaria tuberculosa* Sowerby, Proc. Zool. Soc. London, 1832, p. 51. "*Hab.* ad littora Americae Meridionalis. (Iquiqui)." — Sowerby, Conch. Illustr., *Cancellaria*, December 7, 1832, p. 6, pl. 13, fig. 36. "Dredged in sandy mud, at a depth of seven fathoms, at Iquiqui. Mr. Cuming."
Cancellaria tuberculata Sowerby, Thes. Conch. vol. 2, 1855, p. 457, pl. 94, fig. 52. "From Iquiqui, in sandy mud, six to twelve fathoms water."

[5] Conch. Icon. vol. 10, 1856, *Cancellaria*, sp. 36, pl. 8, figs. 36a, 36b. Iquique, Peru. Dredged in seven fathoms; Cuming.

Centrifuga leeana Dall

Plate 5, figure 11

Murex (chicoreus) leeanus Dall, Proc. U. S. Nat. Mus. vol. 12, 1889, p. 329, pl. 7, fig. 1. "Off Cerros Island, Lower California, in 44 fathoms, mud." — Arnold, Mem. Calif. Acad. Sci., vol. 3, 1903, p. 243, pl. 7, fig. 1. Pleistocene at San Pedro, Calif.

Purpura (Centrifuga) leeana (Dall), Grant & Gale, Mem. San Diego Soc. Nat. Hist. vol. 1, 1931, p. 707. Arnold's record from the Pleistocene cited; living from Guadalupe Island to Cedros Island, Lower California.

Five young specimens were dredged near Cedros Island, off Lower California. This species seems to be closer to *Trophon* than to either *Murex* or *Purpura;* therefore we have considered *Centrifuga* as a separate genus in the present paper. The species, *C. leeana,* seems to be very restricted in its range. The type was dredged in 44 fathoms off Cedros Island, and most of the few specimens in California collections are from Scammon Lagoon and San Ignacio Lagoon, presumably collected by Captain Porter.

Mitra zaca Strong, Hanna & Hertlein, new species

Plate 5, figure 10

Shell fusiform, heavy, very large, covered with a thin, blackish epidermis; whorls with a narrow, rounded shoulder occupying about one eighth of the width between the sutures, below which they are very slightly convex; surface smooth except for a few faint spiral threads on the shoulder and about 15 slightly stronger threads on the base; aperture long and narrow, about half the length of the shell, white within; outer lip not thickened; inner lip with a broad, slightly tinted callus covering the body of the shell; columella with three strong plaits and a smaller spiral ridge at the base; canal short, slightly recurved, forming a distinct fasciole. The type has nine whorls without the nucleus and measures: length, 130; maximum diameter, 34 mm.

Holotype: No. 6061 (C. A. S. type coll.) from Loc. 27594 (C. A. S.) dredged in Santa Maria Bay, Lower California. Templeton Crocker, collector, August 11, 1932. Additional specimens were secured in the same place.

This species probably reaches the largest size of any *Mitra* known from the west coast. In shape and color it is quite similiar to the well-known *Mitra (Strigatella) idae* Melvill from the California coast but it is much larger, the epidermis is much thinner and it entirely lacks the finely pitted spiral lines characteristic of that species. The unfigured *Mitra (Strigatella) mexicana* Dall[6] dredged off Guaymas is also similar but the type is only 72 mm. in length and is said to

[6] Proc. U. S. Nat. Mus., vol. 56, 1919, p. 309. "Off Guaymas, Mexico, in 71 fathoms, sand."

have moderately rounded whorls, sculptured with feeble, flattened, spiral cords. The new species can be referred to the subgenus *Strigatella* and to the section *Atrimitra*.

The species is named for Mr. Crocker's yacht, *Zaca*.

Calliostoma bonita Strong, Hanna & Hertlein, new species

Plate 5, figures 5, 6

Shell conical, brilliantly polished and highly colored; body whorl with two sharp spiral keels, one on the periphery and the other at about one third the distance between the periphery and the suture, angulating the whorls of the spire; in addition to these spiral keels the entire surface is marked with smooth spiral threads, of which, on the body whorl, there are eight between the suture and the upper keel, three between the keels, and twelve on the base; ground color of the shell white, the spiral threads with irregularly spaced bright brown dots, much closer on the spire than on the base, although not arranged in any definite pattern; the wider spacing at irregular intervals gives the appearance of white axial flames; umbilical region excavated, purple, bounded by a rounded carina, ending in a tooth-like projection at the base of the columella; aperture subquadrate, pearly within. The type has eight whorls and measures: height, 21.5; maximum diameter, 22 mm.

Holotype: No. 6044 (C. A. S. type coll.) from Loc. 27527 (C. A. S.), dredged in Acapulco Bay, Mexico. Twenty-one additional specimens were secured at the same place; Templeton Crocker, collector, April 4, 1932.

This species is very similar in shape to *Calliostoma palmeri* Dall[7] from the Gulf of California, which also has the excavated, purple umbilical region. The present species is more highly colored, with a different number of spiral threads, which are smooth instead of granular.

Calliostoma rema Strong, Hanna & Hertlein, new species

Plate 5, figures 3, 4

Shell depressed, polished but with the colors rather dull; body whorl with two broad, spiral keels, one on the periphery and the other at about one third the distance between the periphery and the suture, angulating the whorls of the spire; in addition to the keels the entire surface is marked with granular spiral threads, of which on the body whorl there are three between the suture and the upper keel, one between the keels, and eight on the base, with, on the spire, faint indications of very fine intercalary threads; ground color of the shell pale brown, with the spiral threads dotted here and there with

[7] Dall, Amer. Jour. Conch., vol. 7, pt. 2, November 2, 1871, p. 125, pl. 15, fig. 15. "Guaymas, ten specimens. Dr. Palmer."

darker spots, most noticeable on the base; the surface also painted with broad, indistinct, whitish patches and axial lines; umbilicus open, bordered by a rounded carina, the end of which forms a tooth-like projection at the base of the columella; columella curved, white, in the adult somewhat reflected over the umbilicus; aperture subquadrate, pearly. The type has 4½ whorls and measures: height, 11 mm.; maximum diameter, 16.6 mm.

Holotype: No. 6045 and paratype no. 6046 (C. A. S. type coll.) from Loc. 23779 (C. A. S.), dredged in from 10 to 25 fms. off the penal settlement on Maria Madre Island of the Tres Marias Group, Mexico by G. D. Hanna and E. K. Jordan in 1925. Several additional specimens, mostly young, were secured at the same place and a single specimen was dredged by the Crocker Expedition at Loc. 27527 (C. A. S.) in Acapulco Bay, Mexico.

This species is quite different from all the known west coast forms in the depressed shape and in the umbilicus, which in the young shells is entirely open and in the adult only partly covered by the reflected columella.

Metula amosi Vanatta

Plate 5, figure 12

Metula amosi Vanatta, Proc. Acad. Nat. Sci. Philadelphia, vol. 65, January, 1913, p. 22, figs. 1, 2. "Panama."

Specimens dredged in Acapulco Bay agree in all the details shown in the figures given by Vanatta of the type of *Metula amosi*. *Metula clathrata* Adams & Reeve[8] has been reported from Western Panama by Tomlin, but Tryon has given Cape of Good Hope, South Africa as the locality for the species. The name *Metula hindsii* H. & A. Adams[9] has been definitely stated by Tryon[10] to represent the same species as *Buccinum metula* Hinds,[11] from western Panama. From the facts at hand, we see no reason for abandoning the name given by Hinds to the Panamanian species which would then be *Metula metula* (Hinds). A species doubtfully referred to the genus is "*Fusus*" *bellus* C. B. Adams.[12] Carpenter[13] considered that this species might belong to *Metula* but Tryon stated that he was inclined to think that it should be placed in *Columbella*. Woodring[14] has given a discussion of the genus *Metula* and the problems connected with the selection of the type species.

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[8] *Buccinum clathratus* Adams & Reeve, Voy. Samarang, Moll. 1850, p. 32, pl. 11, fig. 12. — Tryon, Manual Conch. vol. 3, 1881, p. 152, pl. 72, fig. 238. "*Cape of Good Hope:* 136 fathoms."

[9] *Metula hindsii* H. & A. Adams, Genera Rec. Moll. vol. 1, 1858, p. 84. — Tryon, Manual Conch. vol. 3 1881, p. 153, pl. 72, fig. 240. "*West Coast of Veragua;* in mud, at a few fathoms' depth."

[10] Manual Conch. vol. 3, 1881, p. 251. "*Hindsii* (*Metula*), H. & A. Adams' Genera, 1, 84. = *Buc. metula*, Hinds."

[11] *Buccinum metula* Hinds, Zool. Voy. *Sulphur*, no. 7, (Moll. pt. 2), October 1844 [Date given on cover], p. 31, pl. 16, figs. 13, 14. "Inhab. west coast of Veragua. Obtained at a depth of a few fathoms, among mud."

[12] *Fusus bellus* C. B. Adams, Ann. Lyceum Nat. Hist. New York, vol. 5, 1852, p. 353, 531. "Panama." — Tryon, Manual Conch. vol. 3, 1881, p. 153 (as *Metula bella*).

[13] Proc. Zool. Soc. London, 1863, p. 9. Reprint in Smithsonian Miscell. Coll. no. 252, 1872, p. 183.

[14] Carnegie Inst. Washington, Publ. no. 385, 1928, pp. 285-287.

Turritella mariana Dall

Plate 6, figures 1-4

Turritella mariana Dall, Bull. Mus. Comp. Zool. vol. 43, no. 6, October, 1908, p. 327, pl. 11, fig. 14. "Near the Tres Marias Islands, in 80 fathoms, rocky bottom, temperature 51.2° F."

Many specimens of this interesting species were dredged at the following localities; Loc. 27527 (C. A. S.), Acapulco Bay, Mexico; Loc. 27571 (C. A. S.), 20-45 fathoms in Lat. 16° 39′ N, Long. 99° 24′ 30″ W., to Lat. 16° 38′ N., Long. 99° 27′ 30″ W.; Loc. 27573 (C. A. S.), Lat. 18° 14′ N., Long. 103° 23′ W., in 60 fathoms; Loc. 27584 (C. A. S.) Lat. 23° 03′ to 23° 06′ N., Long. 109° 36′ to 109° 31′ W., in 20-220 fathoms.

The original specimen was only 25 mm. in length; large series of adults from the localities listed above show the pronounced tendency of the shell to develop two large spiral ridges on each whorl. These are sometimes noded and sometimes not on the later whorls. A selection has been made for illustration to show some of the variation in sculpture and shape.

It is obvious from a study of this excellent series that the form described as *Turritella imperialis* from the Pliocene beds at Coyote Mountain, Imperial County, California[15] is exceedingly close and may fall into synonymy. The similarity between the Pliocene and living forms is far greater than between the Pliocene and lower Miocene species.

Woodring's[16] recent attempt to place the Imperial formation in the lower Miocene because of this last mentioned relationship might not have been made had it been recognized how closely the fossils are related to the living fauna of the Gulf of California and the waters to the southward.

Mansfield[17] has shown the great similarity which exists between some of the fossils of the Imperial formation and those of certain Pliocene deposits of southern Florida. In view of the fact that the most trustworthy evidence furnished by paleontology indicates a comparatively late epoch of deposition in the region of Coyote Mountain, something far more convincing than has thus far been disclosed will need to be brought forward before a lower Miocene age can be accepted.

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[15] Hanna, G. D. Paleontology of Coyote Mountain, Imperial County, California. Proc. Calif. Acad. Sci. ser. 4, vol. 14, no. 18, Mar. 23, 1926, pp. 427-503, pls. 20-29.

[16] Woodring, W. P. Distribution and age of the marine Tertiary deposits of the Colorado Desert. Carnegie Inst. Wash. Publ. no. 418, (Cont. to Palaeo. I) Jan. 1931, pp. 1-25.

[17] Mansfield, W. C. Pliocene fossils from limestone in southern Florida. U. S. Geol. Surv. Prof. Ppr. 170-D, 1932, pp. 43-56, pls. 14-18.

Turritella radula Kiener

Plate 6, figures 7, 8

Turritella radula KIENER, Spec. General et Icon. Coq. Viv., *Turritella*, p. 13, 1873, pl. 2, fig. 1 (two figures). [No locality cited.] — REEVE, Conch. Icon. vol. 5, *Turritella*, sp. 30, pl. 7, fig. 30. "*Hab.* Isle of Muerte, Bay of Guayaquil (found at the depth of eleven fathoms in sandy mud); Cuming."—TRYON, Manual Conch. vol. 8, 1886, p. 201, pl. 63, fig. 77. "Bay of Guayaquil."—TOMLIN, Jour. Conch. vol. 18, no. 6, December, 1927, p. 168. "Jicaron I. and Isla del Rey, on shore; Coiba, dredged in 10-12 f.; Gargona, very common in 15 f.; James I."

Excellent specimens were dredged at Loc. 27573 (C. A. S.), Lat. 18° 14′ N., Long. 103° 23′ W., off Acapulco, Mexico, 60 fms. The species is characterized by a strong, noded spiral ridge at the base of the whorl. The suture in the specimens available is not as deeply impressed as is shown in Reeve's figure but otherwise agreement seems sufficiently close to justify the identification.

Xenophora robusta Verrill

Plate 5, figures 8, 9; plate 6, figures 5, 6

Xenophora robusta VERRILL, Amer. Jour. Sci. & Arts, ser. 2, vol. 49, no. 146, March, 1870, p. 226. "Near La Paz, J. Pedersen. Two fresh specimens."

Five living specimens were dredged by Mr. Crocker in Lat. 23° 02′ N., Long. 109° 32′ W., in 25 fathoms; and one living and two dead specimens from Lat. 15° 40′ N., Long. 93° 49′ W., 28 fathoms. The species, previously unfigured, has been heretofore known only from the description and the two original specimens. It is the only living representative from the eastern Pacific and must be very locally distributed as well as rare. Four fossil species have been reported from the Tertiary of western North America.[18]

The type of the species is No. 8882, Peabody Museum, Yale University and the label bears the following information: "La Paz, Lower Calif. Coll. James Pedersen, 1885." The date is an obvious error. We have been permitted to study and photograph the speci-

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[18] *Xenophora hawleyi* Loel & Corey, Univ. Calif. Publ. Bull. Dept. Geol. Sci. vol. 22, no. 3, 1932, p. 269, pl. 63, fig. 12. "From the green conglomerate near the base of the Vaqueros horizon, about 2.5 miles southwest of Buelton, western Santa Ynez Mountains, Santa Barbara County, Calif." Vaqueros, lower Miocene.

Xenophora simiensis Nelson, Univ. Calif. Publ. Bull. Dept. Geol. Sci. vol. 15, no. 11, 1925, p. 422, pl. 55, figs. 7 *a-c*. From Loc. 422 (Calif. Acad. Sci.) "three miles west of Santa Susana; near base of Martinez, just north of contact." Martinez, lower Eocene.

Xenophora stocki Dickerson, Univ. Calif. Publ. Bull. Dept. Geol. vol. 9, no. 17, 1916, p. 502, pl. 37, figs. 4 *a-b*. Loc. 2226 (Univ. Calif.), Tejon group, Rose Canyon, San Diego County, Calif.—Hanna, M. A., Univ. Calif. Publ. Bull. Dept. Geol. Sci. vol. 16, no. 8, 1927, p. 306. La Jolla formation, San Diego County Calif. B. L. Clark is cited as authority that the species occurs in the Domengine formation in Simi Valley and near Coalinga, Calif. Upper or middle Eocene.

Xenophora zitteli Weaver, Univ. Calif. Publ. Dept. Geol. vol. 4, no. 5, 1905, p. 118, pl. 12, fig. 8. "Found southwest of Martinez on the west side of the Del Hambre Cañon road. This species occurs only in the lower beds of the Martinez group."—Dickerson, Univ. Calif. Publ. Bull. Dept. Geol. vol. 8, no. 6, 1914, pp. 111, 151. "Martinez north of Mount Diablo." "Type locality, Benicia, Selby." "*Solen stantoni* zone." "*Meretrix dalli* zone."

men through the kindness of Dr. Stanley C. Ball, Curator, Department of Zoology of the Peabody Museum. The specimen is a fresh but dead shell, with the apertural margin somewhat broken but with the basal characters well preserved. Diam., 56 mm., alt., 45 mm. Most of the erratics have been dislodged but there remain several pebbles, mostly encrusted with corallines, and a few fragments of *Glycymeris* and *Chione*. The sides of the spire are slightly dome shaped at the apex and approximately six whorls can be made out. The erratics were mostly attached in a row, close to the suture line but numerous grains of coarse quartz and shell sand were indiscriminately scattered over the outer surface. The shell has once been attached to a brown paper card with glue and fragments of these materials adhere to one side.

The specimens dredged by Mr. Crocker are in excellent state of preservation and agree in all essential respects with the type. *Pecten*, *Glycymeris* and *Arca* are the most abundant erratics. The operculum is brown, horny, pyriform in shape and with the nucleus completely worn away from the side on which it was situated.

PLATE 5

Fig. 1. *Calliostoma palmeri* Dall. Alt., 24.5 mm., diam., 28 mm. Plesiotype, no. 6043 (C. A. S. type coll.), from Loc. 27665, San Felipe at the head of the Gulf of California; H. N. Lowe, coll. Specimen illustrated for comparison with *Calliostoma bonita*, n. sp. P. 121.

Fig. 2. *Calliostoma palmeri* Dall. Basal view of specimen shown in fig. 1.

Fig. 3. *Calliostoma rema* Strong, Hanna & Hertlein, n. sp. Alt., 11 mm., diam., 16.4 mm. Paratype, no. 6046 (C. A. S. type coll.), from Loc. 23779 (C. A. S.) along east shore of Maria Madre Island, Revillagigedo group, west coast of Mexico. Dredged in 5 to 10 fathoms by G. D. Hanna and E. K. Jordan, 1925. P. 121.

Fig. 4. *Calliostoma rema* Strong, Hanna & Hertlein, n. sp. Alt., 8.9 mm., diam., 12.5 mm. Holotype, no. 6045 (C. A. S. type coll.), from same locality as fig. 3. P. 121.

Fig. 5. *Calliostoma bonita* Strong, Hanna & Hertlein, n. sp. Alt., 21.1 mm., diam. 21.6 mm. Holotype, no. 6044 (C. A. S. type coll.), from Loc. 27527 (C. A. S.), Acapulco Bay, Mexico. Dredged by Templeton Crocker, 1932. P. 121.

Fig. 6. *Calliostoma bonita* Strong, Hanna & Hertlein, n. sp. Basal view of specimen shown in fig. 5. P. 121.

Fig. 7. *Cancellaria bullata* Sowerby. Alt., 32.8 mm., diam., 26 mm. Plesiotype, no. 6057 (C. A. S. type coll.), from Loc. 27596 (C. A. S.) in channel near Cedros Island, off Lower California, Templeton Crocker, Coll., Aug. 15, 1932. P. 119.

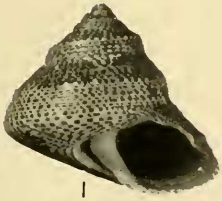
Fig. 8. *Xenophora robusta* Verrill. Alt., 45 mm., diam., 56 mm. Holotype, no. 8882 (Peabody Museum, Yale University), plasto-holotype, no. 6054 (C. A. S. type coll.), from near La Paz, Lower California. P. 124.

Fig. 9. *Xenophora robusta* Verrill. Basal view of specimen shown in figure 8. P. 124.

Fig. 10. *Mitra zaca* Strong, Hanna & Hertlein, n. sp. Alt. 132.2 mm., diam., 36 mm. Holotype, no. 6061 (C. A. S. type coll.), from Loc. 27594 (C. A. S.) Santa Maria Bay, Lower California, below Cape San Lazaro. Templeton Crocker, coll., 1932. P. 120.

Fig. 11. *Centrifuga leeana* Dall. Alt., 34 mm., diam., (including spines), 29 mm. Plesiotype, no. 6056 (C. A. S. type coll.), from Loc. 27596 (C. A. S.) in channel near Cedros Island, off Lower California, Templeton Crocker, coll., Aug. 15, 1932. P. 120.

Fig. 12. *Metula amosi* Vanatta. Alt., 24.2 mm., diam., 9.5 mm. Plesiotype, no. 6058 (C. A. S. type coll.), from Loc. 27527 (C. A. S.), Acapulco Bay, Mexico. Dredged by Templeton Crocker, April, 1932. P. 122.



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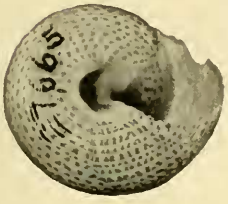

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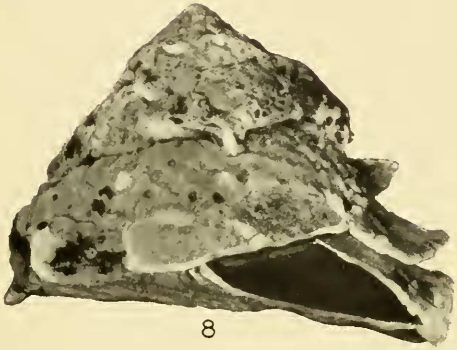

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Plate 6

Fig. 1. *Turritella mariana* Dall. Alt., 66.6 mm., diam., 13 mm. Plesiotype, no. 6050 (C. A. S. type coll.), from Loc. 27571 (C. A. S.), Lat. 16° 39′ N. to 16° 38′ N., Long. 99° 24′ 30″ W. to 99° 27′ 30″ W., in 20 to 45 fathoms. Templeton Crocker, coll., July 15, 1932. P. 123.

Fig. 2. *Turritella mariana* Dall. Alt., 77.8 mm., diam., 12.8 mm. Plesiotype, no. 6051 (C. A. S. type coll.), from Loc. 27584 (C. A. S.) Lat. 23° 03′ to 23° 06′ N., Long. 109° 36′ to 109° 31′ W. in 20 to 220 fathoms. Templeton Crocker, coll., Aug. 4, 1932. P. 123.

Fig. 3. *Turritella mariana* Dall. Alt., 68 mm., diam., 11 mm. Plesiotype, no. 6052 (C. A. S. type coll.), from same locality as specimen shown in fig. 1. P. 123.

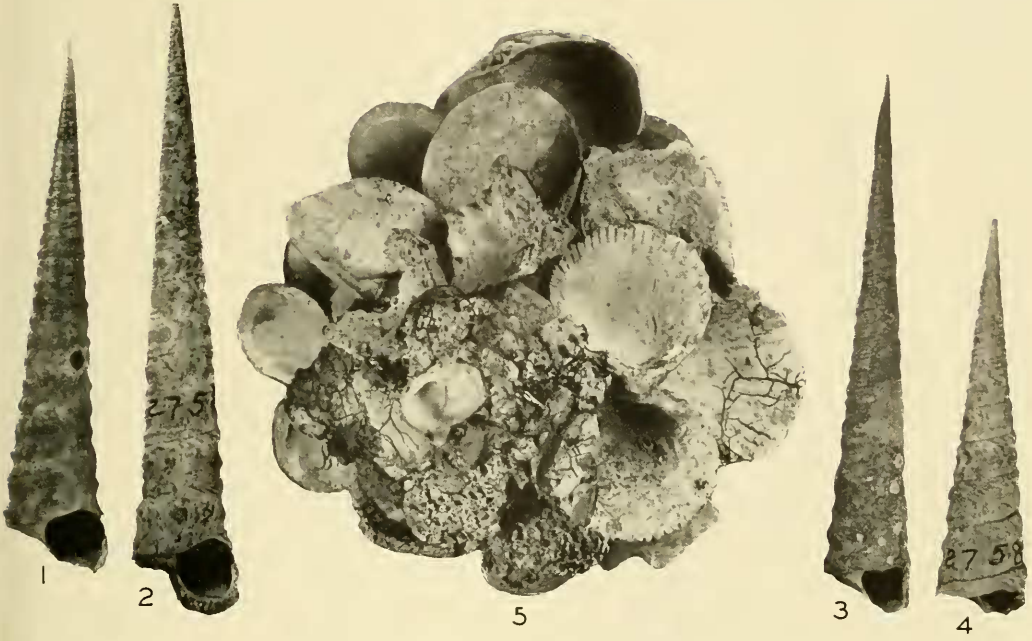
Fig. 4. *Turritella mariana* Dall. Alt., 50.2 mm., diam., 12 mm. Plesiotype, no. 6053 (C. A. S. type coll.), from the same locality as specimen shown in fig. 2. P. 123.

Fig. 5. *Xenophora robusta* Verrill. Alt. approximately 59 mm., diam. approximately 105 mm. Plesiotype, no. 6055 (C. A. S. type coll.), from Loc. 27585 (C. A. S.), Lat. 23° 02′ N., Long. 109° 32′ W., in 25 fathoms, Templeton Crocker, coll., Aug. 5, 1932. P. 124.

Fig. 6. *Xenophora robusta* Verrill. Basal view of specimen shown in fig. 5. P. 124.

Fig. 7. *Turritella radula* Kiener. Alt., 64.1 mm., diam., 12.1 mm. Plesiotype, no. 6048 (C. A. S. type coll.), from Loc. 27573 (C. A. S.), Lat. 18° 14′ N., Long. 103° 45′ W., in 60 fathoms, Templeton Crocker, coll., July, 1932. P. 124.

Fig. 8. *Turritella radula* Kiener. Alt. 61.1 mm., diam., 10 mm. Plesiotype, no. 6049 (C. A. S. type coll.), from same locality as specimen shown in fig. 7. P. 124.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